SHORT COMMUNICATION

THE PRESENCE OF FEMALE HOOKER'S SEA LIONS (*PHOCARCTOS HOOKERI*) ON THE SOUTH-EAST COAST OF NEW ZEALAND

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SUMMARY

Hawke, D. J. (1993). The presence of female Hooker's Sea lions (*Phocarctos hookeri*) on the South-east coast of New Zealand. *New Zealand Natural Sciences* 20:75-77.

Eighty-eight surveys for sea lions at 21 locations from Katiki (45°24' S) to Waipati (46°37' S) were carried out between 1984 and 1992. Four of the 28 animals seen were females, the first report post-sealing of females for mainland New Zealand. Observation of characteristic markings identified 2 different females. Most sightings were of juvenile males (18 of the 28 animals). Six animals were males with varying mane development but no socially mature males were found. Overall sighting density was 0.34/km, compared with 8.6/km from literature results for Otago Peninsula's Papanui Beach.

KEYWORDS: Hooker's sea lion - *Phocarctos hookeri* - pinniped - New Zealand - South Island - Otago Peninsula.

INTRODUCTION

Remains of Hooker's sea lion (*Phocarctos hookeri*) occur in pre-European middens and in caves throughout New Zealand (Anon 1991, Worthy 1992). Compared with its present concentration on New Zealand's subantarctic islands (King 1983), the species' range was therefore much greater before human settlement and commercial sealing. However, *P. hookeri* is now re-establishing on the South Island (Gaskin 1972, Wilson 1979, Hawke 1986). Future understanding of population increase and recolonisation dynamics requires ongoing monitoring of the species at several localities. Understanding of pinniped colonisation dynamics is currently limited, because colonisation is often not noticed until well advanced (Baker 1978). In the present paper I report the results of surveys along the south-east coast of the South Island, using the methods employed by Hawke (1986) for surveys of Papanui Beach (Otago Peninsula; Fig. 1).

STUDY AREA AND METHODS

Eighty-eight surveys for sea lions were made at 21 beaches from Katiki (45°24' S) to Waipati (46°37' S) (Fig. 1) between February 1984 and December 1992. Eight locations were visited > 3 times. The study area was divided into 3 regions: Otago Peninsula; South Otago; and the remaining coast, from Katiki to Nugget Point excluding Otago Peninsula. The first 2 regions have a highly indented coastline while the last has longer, more exposed beaches. Survey distances for each region are shown in Table 1.

Each beach was first examined with binoculars, then walked in each direction. Care was taken to detect animals in dunes or tussock. Observations were made in mid-late afternoon, when haul-out density is highest and most stable (Hawke 1986, Beentjes 1989). *P. hookeri* occupation was defined as the presence of animals, sand wallows, or identifiable tracks. Sea lion tracks are characterised by

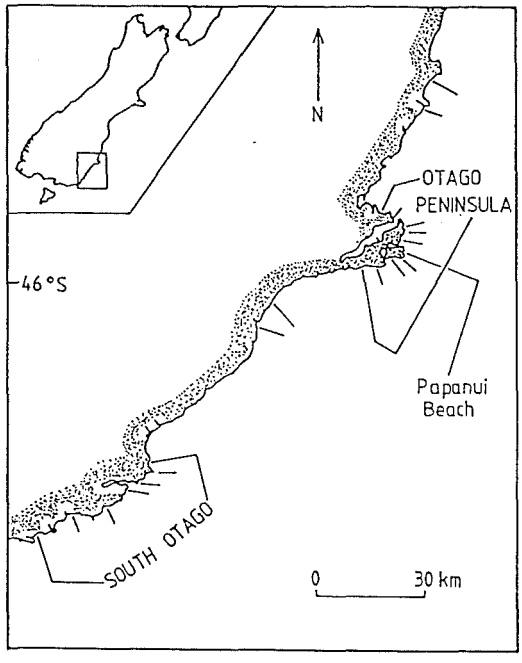

Figure 1. Study area, showing geographic regions surveyed. The short lines indicate survey locations; also shown is Papanui Beach, the site of previous studies, where *P. hookeri* is habitually present.

alternating arcs along the axis of the animal's path. Such arcs are absent from *Arctocephalus forsteri* tracks. Animals were usually found inactive on their bellies (preventing observation of genitalia) and so were sexed using the following criteria. Adult males are large with extensive mane development. Relative to juvenile males which do not have mane development, females are more slender about the chest and shoulders, have a more creamy colouring, and are less aggressive.

Because the surveys were spread over a long period of time, it is likely that many animals were seen repeatedly. Statistical testing was therefore not performed.

RESULTS AND DISCUSSION

The results are summarised in Table 1. Four (15%) of the 28 animals seen were females. This is the first time to my knowledge that female *P. hookeri* have been reported on South Island beaches this century. All were found on Otago Peninsula (Pipikaretu, Ryans and Victory beaches). Pipikaretu and Ryans beaches are relatively sheltered within small bays, whereas Victory Beach is a long exposed beach separating Papanui Inlet from the sea. Two of the females were seen in February and 1 each in January and July. The female seen in January was hauled out 100 m from a sexually mature male, at Ryans Beach. The other 3 females were solitary, although males of varying maturity were seen at the same locations on other occasions. At Papanui Beach, the site where *P. hookeri* is habitually present, only males have been identified in previous studies (Hawke 1986, Beentjes 1989).

Two of the females (seen in 1987 and 1991) were of similar size (approx. 1.6 m standard length) but had differing characteristic markings on the left hindquarters and on the left shoulder. The other 2 sightings, in 1989 and 1991, were of significantly larger animals (approx. 1.8 m standard length). Bearing in mind the year each female was seen, the observation of characteristic markings, and the po-

Table 1. Summary of results by region (Fig. 1), showing number and sex of *P. hookeri* found. The category "males with mane development" includes both subadults and sexually mature adults. No socially mature adult males were seen.

Region	Survey distance (km)	Juvenile males	Males with mane development	Females
Otago Peninsula	52	9	5	4
South Otago	22	9	1	0
Other*	9	0	0	0

*Signs of recent occupancy were found on one occasion

tential for growth in the smaller animals, at least 2 different individuals were seen during the study period.

Six (21%) of the animals were males showing mane development. Some had the morphology of sexually mature males. However, judging by adult males I have seen on Stewart Island, none had the bulk to hold breeding territory. The remaining 18 (64%) were males with no mane development. The predominance of juveniles and subadults (males in this case) is consistent with Baker's (1978) suggestion that pre-reproductive individuals are more likely than adults to haul out on strange shores. *P. hookeri* (re)colonisation appears to be relatively slow, the species having been known from the study area for at least 25 years (Gaskin 1972). In contrast, Northern fur seal (*Callorhinus ursinus*) population on Bogoslof Island, Alaska increased from zero in 1962 to > 400 animals in 1988 (Loughlin & Miller 1989). More dramatically, South African fur seal *A. pusillus pusillus* population on Mercury Island, Namibia increased from zero in 1973 to 16 000 in 1986 (Crawford *et al.* 1989).

P. hookeri occupation was found at all times of the year, and in all 3 regions at 10 of the 21 locations on 31% of the 88 surveys. A total of 28 sea lions were seen on 83 km of beach, but with no animals seen outside Otago Peninsula and South Otago (Table 1). This gives an overall sighting density of 0.34 animals/km, much lower than the 8.6 animals/km on Papanui Beach (117 *P. hookeri* seen by Hawke (1986) during 39 surveys of the 0.35 km beach in 1984/85). The survey methods employed by Hawke (1986) were identical with those of the present study. Sighting densities at Otago Peninsula (0.35/km) and South Otago (0.45/km) were similar. The maximum number of animals found at one time was 3. Animals were solitary on 15 (71 %) of the 21 surveys where *P. hookeri* was seen. None of the 8 locations visited > 3 times showed occupancy at every visit. It is therefore likely that the species is itinerant at the locations surveyed in the present study, although residence has been demonstrated (Beentjes 1989) for Papanui Beach. These observations are consistent with the the colonisation patterns suggested by Baker (1978) and discussed above.

The results presented here suggest that future work should aim to closely monitor the maturity and ratio of males to females along the South Island coast, and to see if Papanui Beach remains an exclusively male haul out site with a sighting density significantly higher than the adjacent coast. These observations would be helpful in elucidating pinniped colonisation dynamics.

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